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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : C23C 26/00, C25D 3/00	A1	(11) International Publication Number: WO 97/26387 (43) International Publication Date: 24 July 1997 (24.07.97)
(21) International Application Number: PCT/KR97/00012 (22) International Filing Date: 20 January 1997 (20.01.97) (30) Priority Data: 1996-1120 19 January 1996 (19.01.96) KR (71) Applicant (for all designated States except US): SAMSUNG DISPLAY DEVICES CO., LTD. [KR/KR]; 575, Sin-dong, Paldal-ku, Suwon-si, Kyungki-do 442-373 (KR). (72) Inventors; and (75) Inventors/Applicants (for US only): KIM, Myung, Sub [KR/KR]; 800-28, Mangmi 1-dong, Nam-ku, Pusan-si 608-131 (KR). KOO, Haeng, Min [KR/KR]; 1303 31/1, 4-ga, Youngsun 2-dong, Youngdo-ku, Pusan-si 606-044 (KR). (74) Agent: KIM, Won, Ho; You Me Patent & Law Firm, 702, Teheran Building, 825-33, Yoksam-dong, Kangnam-ku, Seoul 135-080 (KR).		(81) Designated States: CN, DE, ES, GB, JP, MX, RU, US, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i>
(54) Title: LUBRICATED STEEL SHEET (57) Abstract The degreasing and oxidizing process which is necessary in the conventional process can be omitted by coating resin on the steel sheet which is used in the many machines parts of the inner color picture tube. Thereby reducing environmental problems and rust to the machine parts caused by the degreasing solution and the oil during oxidizing respectively. In addition, the lubricated steel sheet is economical to use because a few steps of the process are deleted.		

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LUBRICATED STEEL SHEET

BACKGROUND OF THE INVENTION5 1. Field of the Invention

The present invention relates to a lubricated steel sheet, more specifically, to a lubricated steel sheet which is coated with zinc and resin, which is used for a panel assembly for a color braun tube, i.e., a frame or an inner shield of machine parts for color picture tubes to make unnecessary
10 degreasing and oxidizing processes and to reduce the time of the process and to solve environmental pollution problems by not using a degreasing solution.

2. Description of the Related Arts

After a shadow mask for a color picture tubes (CPT) is assembled with
15 a screen in a panel, leaving a space between them, it is annealed for further processes, processing and forming processes. The mask is finally formed by a press and foreign substances such as oil, contaminants and fingerprints are removed by a next step, a degreasing process. The degreasing process is to remove oil and foreign substances used in the process for forming by using
20 original trichloroethylene solution. The formed shadow mask is fixed on a frame by welding to maintain the form thereof. For the frame to play a role of fixing the shadow mask, no changes of the form or outer size of the frame must be observed after calcinating for an assembly to be stable against heat. The

frame is assembled through springs which are attached by welding on the sides of the frame. The frame and the degreased mask are electrically welded to produce a mask assembly and oxidized to prevent rust from forming. The oxidizing process is the process which forms an oxidized film of iron oxide(Fe_3O_4) on the surface of the mask to prevent from possible oxidation and diffused reflection such as thermal decalescence and exposure light beam.

A machine part of a thin metal tube, i.e., an inner shield is attached in the color picture tube to control the mobility of electron beams by an earth magnetism and to decrease the influence of the earth magnetism. The beam mobility of a 16 inch color picture tube is $60\ \mu$ without an inner shield and $25\ \mu$ with an inner shield.

The mask assembly on which the machine parts such as the frame and the inner shield are attached by spring frame welding and mask frame welding, is assembled with the panel and calcinating is performed. When the mask-panel assembly is calcinated at a temperature of $450\ ^\circ\text{C}$ for 2 hours, the stress of the mask and the panel is stabilized so as not to affect the metal and the glass from heat. The panel-mask is separated after cooling. To remove the pollutants on the panel such as dust and grease, the assembly is washed with acid solution and rinsed with deionized water.

Trichloroethylene degreasing solution used in the degreasing process in the above process is colorless and has an odor of chloroform. The liquid phase thereof is harmless, however, the gas state thereof has toxicity. The allowable concentration thereof is 100 ppm. It is anesthetic, nonflammable

and insoluble in water. Polyvinyl chloride gloves and protection glasses must be worn because of the danger of trichloroethylene contacting the skin or eyes of human beings and trichloroethylene has the possibility of igniting with oxygen or air by high energy source. In addition, drowsiness headaches, dizziness, unconsciousness or fatal symptoms can occur when a high concentration of trichloroethylene vapor is inhaled. Therefore, an ventilation apparatus is necessary since trichloroethylene is heavier than air and does not disperse rapidly in a closed container or non ventilated room.

SUMMARY OF THE INVENTION

Accordingly, the present invention is intended to overcome the above-described disadvantage of conventional arts and to provide the process for the machine part which reduce loss of the process by deleting the degreasing and oxidizing process and solve the environmental problem by not using the degreasing solution.

An embodiment of the present invention provides a process for a machine part for a color picture tube assembly comprising the steps of coating resin on a steel of machine parts, forming the steel coated with said resin, oxidizing, calcinating and baking the steel.

The process further comprises the step of plating with chromate on the steel before coating.

Another embodiment of the present invention provides a machine part for a color picture tube assembly comprising of steel and a resin layer coated

on the steel.

the machining part for a color picture tube is preferred to further comprise a chromate layer between the steel and resin layer.

Another embodiment of the present invention provides a process for a machine part for a color picture tube assembly comprising the steps of plating zinc on steel of machine parts, coating resin on the steel plated with zinc, forming the steel coated with the zinc and resin and calcinating and baking the steel.

The process is preferred to further comprise the step of plating with chromate on the steel after Plating zinc on the steel.

Another embodiment of the present invention provides a machine part for a color picture tube assembly comprising of steel, a zinc layer plated on the steel and a resin layer coated on the zinc layer.

The machine part for a color picture tube is preferred to further comprise a chromate layer between the zinc layer and resin layer.

Another embodiment of the present invention provides a lubricated steel sheet comprising of steel and a resin layer coated on the steel.

The lubricated steel sheet is preferred to further comprise a chromate layer between the steel and resin layer.

The lubricated steel sheet is preferred to use for manufacturing of a frame or inner shield for color picture tubes.

Japanese Patent 89-1522044 discloses a process for a color picture tube solving the problem of the trichloroethylene solution. After Ni and Cr are

plated on the shadowmask, frame and inner shield with the thickness of 0.5 μ to 1.0 μ . The shadowmask and the frame are welded to produce a maskframe, and the frame and a holder are attached, and the maskframe and a panel are assembled. Then, the fluorescent screen is formed, the oxidized film of metal component is formed through sealing, exhaust and aging processes. Therefore, the surface of the metal formed by a thermal process without an oxidizing process is thinner and harder than a conventional oxidized film.

DETAILED DESCRIPTION OF THE EMBODIMENTS

Although the invention has been described with reference to a preferred embodiment it is to be understood that the invention is not limited to the preferred embodiment as herein described.

EXAMPLE

Zinc and chromate was coated on a steel sheet and then resin was coated thereon. The steel sheet was mold processed in the press by calcinating in nitrogen air and baking to produce a fixed frame and inner shield.

COMPARATIVE EXAMPLE

A cold rolled steel sheet was oxidized at a high temperature in methane gas and air atmosphere and was calcinated, baked and mold processed in the press to produce a frame and inner shield for color picture tubes with a fixed size.

The mechanical properties of a steel sheet coated resin is excellent than that of the conventional steel sheet when they are used as a machine part. The steel sheet coated resin makes the total process simpler because omission of degreasing and oxidizing process.

What is claimed is:

1. A process for a machine part for a color picture tube assembly comprising the steps of:

coating resin on a steel of machine parts;

5 forming said steel coated with said resin;

oxidizing said steel; and

calcinating previously and baking said steel.

2. The process for a machine part for a color picture tube assembly according to claim 1, further comprising the step of plating with
10 chromate on said steel before coating.

3. A machine part for a color picture tube assembly comprising:
steel; and

a resin layer coated on said steel.

4. The machine part for a color picture tube assembly according to
15 claim 3, further comprising chromate layer between said steel and resin layer.

5. A process for a machine part for a color picture tube assembly comprising the steps of:

plating zinc on a steel of machine parts;

coating resin on said steel plated with zinc

20 forming said steel coated with said zinc and resin; and

calcinating previously and baking said steel.

6. The process for a machine part for a color picture tube assembly according to claim 5, further comprising the step of plating with

chromate on said steel after plating zinc on said steel.

7. A machine part for a color picture tube assembly comprising:
steel;

a zinc layer plated on said steel; and

5 a resin layer coated on said zinc layer.

8. The component for the start of work for a color picture tube assembly according to claim 7, further comprising chromate layer between said zinc layer and resin layer.

9. A lubricated steel sheet comprising:

10 a steel; and

a resin layer coated on said steel.

10. The lubricated steel sheet according to claim 9, further comprising chromate layer between said steel and resin layer.

11. The lubricated steel sheet according to claim 9, wherein said
15 lubricated steel sheet is used for manufacturing of a frame or inner shield for color picture tubes.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR 97/00012

A. CLASSIFICATION OF SUBJECT MATTER

IPC⁶: C 23 C 26/00; C 25 D 3/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC⁶: C 23 C 26/00; C 25 D 3/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Database WPIL on Questel

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Database WPIL on Questel, week 08, London, Derwent Publications Ltd., AN 96-075451, JP 07 331 451 (NKK CORP.), abstract.	1-11
A	Database WPIL on Questel, week 50, London, Derwent Publications Ltd., AN 92-411360, JP 04 308 100 A (KAWASAKI STEEL CORP.), abstract.	1-11
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Date of the actual completion of the international search

12 March 1997 (12.03.97)

Date of mailing of the international search report

19 March 1997 (19.03.97)

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